ICAR-NIRCA
.. a Glance

ICAR - NATIONAL INSTITUTE FOR RESEARCH ON COMMERCIAL AGRICULTURE, RAJAHMUNDRY - 533 105, A.P.

Indian agriculture has been witnessing paradigm shift in outlook and focus from food security to income security and from conventional crops to high value commercial crops, aided by technological innovations and enabling policy support. Agriculture is now increasingly viewed as an industry and in fact treated as agri-business with the overall interest to enhance farm returns and profitability. Crop diversification, value addition and export promotion are some key areas that will help to augment the farm returns. Aligning with this agriculture transformation paradigm requires research institutes dealing with commercial crops to redefine their research agenda commensurate with needs of commercial agriculture. Accordingly, ICAR rechristened Central Tobacco Research Institute as National Institute for Research on Commercial Agriculture and broadened the mandate by including Chilli, Turmeric, Castor and Ashwagandha crops besides Tobacco. The vision, mission, mandate of ICAR-NIRCA are as follows:

ICAR-NIRCA Formation Day

Vision, Mission and Mandate

Vision

To emerge as premier institute of excellence for research on commercial agriculture

Mission

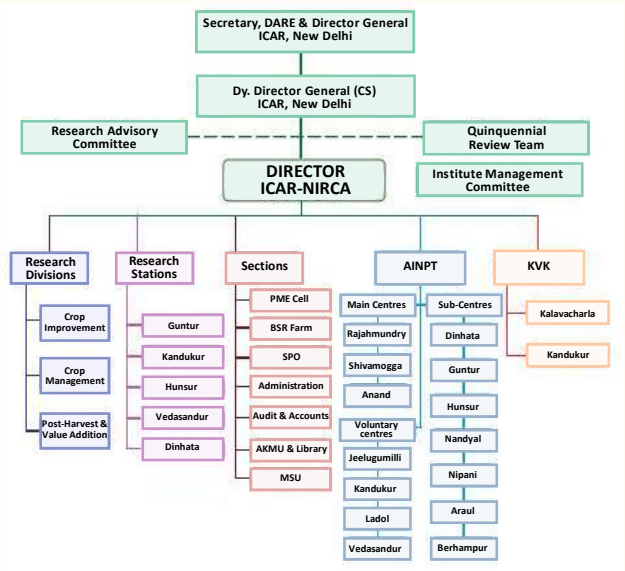
To develop and provide science- technology- innovation-value chain based vibrant Solutions for Enhancing profitability , farm income, employment , nutrition and export while ensuring the sustainability of environment and agro ecological assets

Mandate

- To conduct research on diverse aspects of commercial agriculture for enhancing farm income, employment, nutrition and export earnings, while ensuring sustainability of environment and agro-ecological assets
- To develop cost-cutting strategies, secondary agriculture technologies and diversified value chain models for increased profitability, competitiveness and sustainability
- To deliver front-line extension services for technology and market intelligence dissemination and organize trainings for stakeholders' capacity and competency building
- To collaborate, coordinate and liaison with producing, processing, value addition, marketing and exporting agencies for achieving its vision

ICAR-NIRCA has a network of five research stations situated at Guntur, Kandukur (Andhra Pradesh), Vedasandur (Tamil Nadu), Hunsur (Karnataka) and Dinhata (West Bengal). In addition to its mandated activities, ICAR-NIRCA coordinates the activities of All India Network Project on Tobacco and two Krishi Vigyan Kendras located at Kalavacharla and Kandukur catering to the frontline extension needs of East Godavari and Prakasam district of Andhra Pradesh. Institute will strive to achieve the above mandate by focusing its research efforts on Tobacco, Chilli, Turmeric, Castor, Ashwagandha etc.

ORGANOGRAM



Research Programmes

The research focus is mainly on seed to seed solutions to tobacco crop and post harvest processing, value addition and market intelligence in other mandated crops. The research programmes were broadly categorized into four groups and each programme have specific sub-programmes.

Programme - I : Commercial Crop Improvement.
Programme - II : Crop Production Management in Commercial Agriculture
Programme - III : Post Harvest Produce Management
Programme - IV : Extension and Market Intelligence

Research Projects

To achieve the projected goals the institute is implementing 70 research projects (Institute : 46; External funded : 24). Some of the significant achievements include

Tobacco

Tobacco, the golden leaf is one among the leading commercial crops in India with a cultivated area of 0.45 million ha, producing 760 million kg annually. India is the second largest producer of tobacco after China, and generates enormous socio-economic benefits in terms of employment (45.7 million people) and revenue generation (~ 35,000 crores). FCV, *bidi*, *hookah*, chewing, cigar-wrapper, cheroot, burley, Oriental, HDBRG, Lanka, *Pikka*, *Natu* etc. are the main types of tobacco grown in the country, with FCV and burley tobacco being the main exportable types. FCV tobacco used in cigarettes constitutes 30% of total tobacco production and 80% of overall exports. Among the different states, Andhra Pradesh, Karnataka and Gujarat account for >80% share of area and production.

Varieties released

ICAR-CTRI has released/identified 107 tobacco (FCV-34 and Non-FCV- 73) varieties/hybrids having high yield potential and resistance/tolerance to abiotic and biotic stress. The released varieties have the yield potential of 3,300 kg in FCV and 4,500 kg in non-FCV tobacco.


FCR-15


FCH-2


YB-22


Meenakshi

Germplasm maintained

ICAR-NIRCA is maintaining a total number of 3386 germplasm accessions of different tobacco types for varietal improvement and identification of traits of commercial importance. DUS guidelines were developed for FCV and *bidi* tobacco which facilitates in registration of tobacco varieties. A total number of eight germplasm lines with special traits were registered with NBPGR, New Delhi.

Seed supply

ICAR-NIRCA is supplying more than 9.0 tons of pure seed of all types of tobacco annually to meet > 90% seed requirement of the farmers. Tobacco seed portal was developed for transaperent and seamless tobacco seed supply to the farmers.

Agro-technologies developed

Site specific nursery technologies including tray nursery, microsprinkler irrigation, climate resilient production technologies viz., water harvesting and drought management measures in SLS and KLS, water productivity enhancement through drip irrigation in NLS, Soil fertility thematic maps for FCV tobacco, INM & IPM technologies for different tobaccos, integrated management of *Orobanche*, crop intensification & diversification modules and Solar thermal energy based Interventions to reduce the wood consumption, Phytochemicals extraction from tobacco & tobacco waste and tobacco seed oil for human consumption were developed.


Tray Seedlings

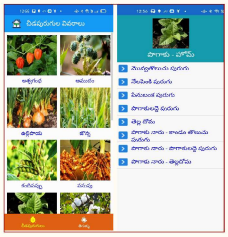

Farm Pond Technology


Drones

Technology outreach activities

Since its inception, the ICAR-NIRCA has been providing in-season contingency advisories to the farming community in the country and contributing to the capacity building of all the stakeholders including farmers, manufacturers, traders, Tobacco Board staff etc. to improve tobacco production efficiency and produce quality. Important technology dissemination activities include OFTs, FLDs, Capacity building programmes, diagnostic visits, field days and Kisan Melas. Some of the innovative outreach programmes implemented in convergence mode include 'Field friends programme', Model village concept, Quality circles and Scientist-Farmer- Trade- Board interaction meetings. Every year the institute organizes 55-60 programmes for the benefit of the farmers.

ICTs in tobacco

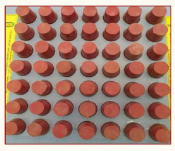


ICAR-NIRCA developed ICTs viz., mobile apps, decision support systems, e-portals, expert systems and whatsapp groups which were proven effective in disseminating precise, reliable and updated information timely to the tobacco farmers and contributing to knowledge-rich FCV tobacco farming for enhancing the farmers income.

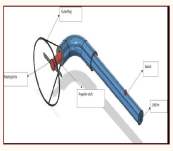
IPR and Technology Commercialization

ICAR-NIRCA and its KVKs have developed two patents and nine copyrights were granted from the research programmes implemented. Labour saving and drudgery reducing mechanization tools such as Bale pressing machine, polytray growth medium pressing tool and Hand held battery operated tool in tobacco production were developed and commercialised. For effective control of suckers in tobacco a new suckericide '**Sucker Stop'** was developed in PPP mode and commercialsed.

Bale Pressing Tool



Media Pressing Tool



Topping Tool

Suckerstop

Publications

The scientists of ICAR-NIRCA have published research papers in high rated national and international journals. On an average, the Institute has published 36 publications every year in the last 7 decades.

GOVT. OF INDIA PROGRAMMES

ICAR-NIRCA is implementing different programmes in Scheduled Caste Sub Plan, Tribal sub plan and NEH Programme under the themes *viz.*, integrated pest management, post-harvest value addition, animal husbandry, demonstrations, capacity building programmes and awareness programmes. Critical inputs viz., improved high yielding variety seeds (tobacco, paddy, turmeric, maize, bengal gram and biofortified korra seed, castor hybrid, coriander and ground nut), planting material (arecanut, cashew, mango and marigold seedlings), irrigation pipes, polytrays for nursery, sprayers, taurpaulins, cattle feed, millet nutrikits etc. were supplied. Facilities were created for value addition, data base management and capacity building. A total number of ~22,000 farmers were covered under this programme.

SCSP

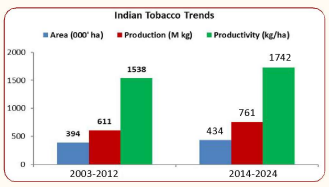
TSP

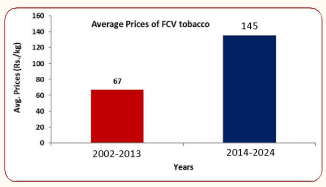
NEH

Impact on Tobacco Sector

ICAR-NIRCA, apart from research has made a phenomenal contribution to technology adoption and transfer activities which resulted in productivity and quality improvement of tobacco. Some of the major impacts are furnished below:

- **Adoption of tobacco varieties/technologies of NIRCA:** More than 90% of the tobacco area in the country is covered by NIRCA varieties and technologies.
- **Increase in Productivity of Tobacco:** The concerted research efforts of ICAR-NIRCA have led to a significant increase in the productivity of tobacco in the country. The annual average productivity of tobacco was very low at 732 kg/ha during 1950-60 and gradually increased over the decades and reached 1742 kg/ha during 2010-2024 owing to the large-scale adoption of scientific interventions and practices developed by the Institute.
- **Productivity-led growth in Tobacco Production:** The area under tobacco cultivation in the country has shown a slight increase from 374 lakh hectares during 1950-60 to 434 lakh hectares during 2010-2024. However, the average tobacco production increased by >2.5 times during the corresponding period (from 275 million kg to 761 million kg), primarily attributed to due to the technological interventions in terms of high-yielding varieties, timely supply of quality seed, sustainable production, and protection practices made available by the institute.
- **Tobacco Exports:** Scrupulous adoption of technology interventions has led to the production of quality leaves with low levels of pesticide residues and free from NTRMs. The annual tobacco exports from the country increased by 2.3 times in volume and 8.4 times in value during the past three decades i.e. from an average of 103 million kg and Rs.692 crore during 1991-01 to 294 million kg and Rs. 12006 crores during 2011-24, respectively.





New Research Initiatives

1. Breeding tobacco varieties with agronomically superior traits including climate resilience, resistance to biotic and abiotic stresses
2. Genome editing for safer tobacco production.
3. Estimation of carbon emissions and reducing the carbon foot prints in tobacco
4. Development of customised equipment for interculture operations, leaf stitching and harvesting
5. Rhizobiome studies for enhancing the nutrient use efficiency.
6. Complete wood replacement with Gas based interventions
7. Development of market intelligence-based ICT models for efficient marketing and profit making.
8. Assessment of Phyto-chemical profiles in chilli, turmeric, ashwagandha and castor.
9. Value addition in chilli, turmeric, ashwagandha and castor through product diversification

Knowledge Partner for Commodity Boards

The ICAR-NIRCA is a unique institution that provide technology backup for Tobacco Board, Ministry of Commerce, Govt. of India. Further, the institute is extending support in organising various technology outreach activities in convergence for dissemination, in-season contingency advisories, digital technologies to the farming community, contributing to the capacity building of all the stakeholders involved. The institute is striving hard to be the Knowledge partner for Spices Board, National Medicinal Plants Board and to the recently established Turmeric Board.

Infrastructures Facilities

To cater the needs of the envisaged mandate the institute is empowered with adequate scientific strength spread over three major divisions viz., Crop Improvement, Crop Production and Post harvest & Value addition. Consequent to the broadened mandate the institute has became research centre of All India Coordinated projects of Vegetable, Spices, Castor, Medicinal and Aromatic plants.


Chilli dryer


Turmeric processing unit


LCMS


Seed packing machine


Lift facility


PCR machine

Service Functions

The Institute provide reliable services to its stakeholders through (i) Pure Seed Supply (ii) Institute Technology Management Unit (iii) Pesticide Residue Analysis (v) Soil and Water Testing (vi) Leaf Quality Estimation (vii) Smoke Quality Evaluation (viii) Consultancy Services/ Contract Research (ix) Capacity Building *etc*.

Linkages

The institute has developed strong linkages with other ICAR institutes viz., NBPGR, New Delhi; NRCG, Pune; CIAE, Bhopal; NBAIR, Bangalore; NAARM, Hyderabad; DMAP, Anand; IIHR, Bangalore and IIVR, Varanasi *etc*. other scientific organizations *viz.,* IICT, Hyderabad; NIN, Hyderabad, CFTRI, Mysore; CIMAP, Lucknow and PPV&FRA, New Delhi. Institute signed MoUs with public sector organizations *viz*., NABARD; Universities *viz.,* Tamil Nadu Agricultural University, Coimbatore; Sri Konda Laxman Telangana State Horticultural University, Mulugu; Yogi Vemana University, Kadapa; Adikavi Nannaya University, Rajahmundry; Vignan University, Guntur for research collaborations through student exchange programme. Under Public-Private partnership, inked an MoU with M R BIOCHEM PVT. Ltd. for synthesizing and evaluating specialty chemicals tailored for diverse uses in tobacco cultivation. To strengthen the collaboration with Industry, singed MoUs with Alliance One Industries India Pvt. Ltd., Guntur; Krishna Agro Bio Products Pvt. Ltd., Hyderabad; FMC Corporation India Pvt. Ltd, Mumbai; RJ Technoquips, Hunsur; IOCL Mumbai, for collaborative research programmes and technology commercialization. The Institute is being involved in organizing National/ International events on contemporary issues of commercial agriculture for setting policy frame work as well as developing research roadmap for enhancing the export revenue and farmers income.


Brainstorming session on Chilli and Turmeric


International Symposium


Mou with IICT, Hyderabad


MoU with Syngenta India Pvt Ltd.

MoU with Yogi Vemana

Way Forward

Providing technological solutions to all the stakeholders in addressing the various challenges related to post-harvest processing, value addition, secondary agriculture, market intelligence of the Tobacco, Chilli, Turmeric, Aswagandha and Castor in the perspective of Commercial Agriculture through inclusive research and development for strengthening the exports there by the farmers income.

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